Taking into account the individual amounts of silica which flow into the bath from the different sources, and calculating the quantities of phosphorus belonging to each, which the charge must exhibit in order to give the slag ^ tho desired content of phosphoric acid, one obtains the following:—

(a) By ordinary working methods 0'4f> per cent. SiCX, reaches the bath from tho furnace1 structure, and consequently the •big iron must contain in relation to this amount of silica . ^. . - . 0-15 X (HiS - 0%'JO JUT cvnt. P

(1) further, the pig iron may not contain Idss than (.)•(> per cent. Si if one wishes ilot to place the furnace working tinder too unfavourable conditions ; thin, however, yields 0*6 X 2' 14 = 1'IJ per cent, of SiOa, which again demands 1-3 X (HIS . * * "-• <HW por omit. V a total of « . * 1-liO per rent. I'

A pig iron with 0"6 per cent. Si must, therefore, possess at the least a phosphorus content of 1*20 per emit. Now since, however, for the refinement of the same, frequently up to 30 per cent, of ore is necessary, and since one may well admit up to 5 per cent. SiOa in the ore, so will still 005x80— 1'5 per cent, on the weight of the pig iron reach tho bath, and, therefore, the phosphorus content of tho pig iron ho increased by l'5xO'68=about 1 per cent, and amount to at least 2*2 per cent.

It is the merit of the Bertrand-Thiel process to have first practically shown that the production of a phosphoric, open-hearth furnace slag of equal value to that of tho Thomas process is possible with charges with an average of l*r> to 2*7 per cent. P. The experience gained thereby permitted also the perception of the conditions which admit the best utilisation of the phosphorus content of tho pig iron.

One knows that the phosphorus can be removed before tho carbon, and further that the slag which taken up the resultant phosphoric acid increases in its amount with progressive decarburisation. Therefore, the phosphoric acid will be present in the highest concentration in the slag, if the decarburisation during the winning of the phosphoric acid remainn reduced to the smallest possible extent, and in this case one is able to win